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10/088,476	03/20/2002	Shinya Hirota	112340	2940

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EXAMINER

NGUYEN, TU MINH

ART UNIT PAPER NUMBER

3748

DATE MAILED: 12/16/2003

10

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.
10/088,476

Applicant(s)
Hirota et al.

Examiner
Tu M. Nguyen

Art Unit
3748



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Sep 30, 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-21 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8-15 is/are allowed.
- 6) ☒ Claim(s) 2-7, 16-19, and 21 is/are rejected.
- 7) ☒ Claim(s) 20 is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on Mar 20, 2002 is/are a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____
- ☐ Interview Summary (PTO-413) Paper No(s). _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other:

Art Unit: 3748

DETAILED ACTION

1. An Applicant's Amendment filed on September 30, 2003 has been entered.

Claim 1 has been canceled; and claims 2, 6, 8, 12, 15-17, 20, and 21 have been amended.

Overall, claims 2-21 are pending in this application.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office Action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 2, 3, 6, and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Tokuda et al. (U.S. Patent 5,489,319).

Re claim 2, as shown in Figure 1, Tokuda et al. disclose an exhaust gas purification apparatus for an engine having a combustion chamber, comprising:

- an exhaust passage (2),
- a particulate filter (3) arranged in the exhaust passage for removing particulates in

exhaust gas exhausted from the combustion chamber by oxidation,

Art Unit: 3748

- a device (8, 9) for controlling characteristic of the exhaust gas flowing into the particulate filter, and

- means (temperature sensors (13, 14)) for judging if the particulate filter will be deteriorated by heat derived from the oxidation of the particulates,

wherein, when the judging means judges that the particulate filter will be deteriorated by heat, the controlling device changes the characteristic of the exhaust gas flowing into the particulate filter to prevent the particulate filter from being deteriorated by heat (see at least Figure 3 and line 55 of column 4 to line 51 of column 5); and

wherein the controlling device is adapted to control the amount of the exhaust gas flowing into the particulate filter and wherein, when the judging means that the particular filter will be deteriorated by heat (step 303 with YES answer), the controlling device performs one of a first control operation (step 313) to make the amount of the exhaust gas flowing into the particulate filter smaller than a first threshold and a second control operation to make the amount of the exhaust gas flowing into the particulate filter larger than a second threshold which is larger than the first threshold (step 305 with YES answer and step 315).

Re claim 3, in the apparatus of Tokuda et al., the apparatus further comprises a bypass mechanism (valves (8, 9) and bypass pipe (6)) for making at least a part of the exhaust gas bypass the particulate filter, and wherein the controlling device makes the amount of the exhaust gas flowing into the particulate filter smaller than the first threshold by the bypass mechanism making at least a part of the exhaust gas bypass the particulate filter (see Figure 3).

Art Unit: 3748

Re claim 6, as shown in Figure 1, Tokuda et al. disclose an exhaust gas purification apparatus for an engine having a combustion chamber, comprising:

- an exhaust passage (2),
- a particulate filter (3) arranged in the exhaust passage for removing particulates in exhaust gas exhausted from the combustion chamber by oxidation,
- a device (8, 9) for controlling characteristic of the exhaust gas flowing into the particulate filter, and
- means (temperature sensors (13, 14)) for judging if the particulate filter will be deteriorated by heat derived from the oxidation of the particulates,

wherein, when the judging means judges that the particulate filter will be deteriorated by heat, the controlling device changes the characteristic of the exhaust gas flowing into the particulate filter to prevent the particulate filter from being deteriorated by heat (see at least Figure 3 and line 55 of column 4 to line 51 of column 5); and

wherein the judging means (13, 14) judges that the particulate filter will be deteriorated by heat when the temperature of the particulate filter is higher than a predetermined temperature (lines 42-47 of column 2).

Re claim 7, in the apparatus of Tokuda et al., the predetermined temperature is a temperature at which the particulate is ignited.

Art Unit: 3748

4. Claims 6 and 7 are further rejected under 35 U.S.C. 102(b) as being clearly anticipated by Pattas (U.S. Patent 5,582,002).

Pattas discloses an exhaust gas purification apparatus, comprising all of the features and limitations as claimed.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tokuda et al. as applied to claim 2 above, in view of official notice.

Re claim 4, the apparatus of Tokuda et al. discloses the invention as cited above, however, fails to disclose that the controlling device makes the amount of the exhaust gas flowing into the particulate filter smaller than the first threshold by reducing the amount of the air taken into the combustion chamber, and makes the amount of the exhaust gas flowing into the particulate filter larger than the second threshold by increasing the amount of the air taken into the combustion chamber.

Art Unit: 3748

It is well known to those with ordinary skill in the art that a means to control an amount of the exhaust gas flowing in an exhaust system of an engine is to control an amount of air entering into a combustion chamber. Thus, Tokuda et al. can also reduce an amount of the exhaust gas flowing into the filter by reducing an amount of air into a combustion chamber. Therefore, such disclosure by Tokuda et al. is notoriously well known in the art so as to be proper for official notice.

Re claim 5, in the modified apparatus of Tokuda et al., the controlling device reduces the amount of the air taken into the combustion chamber by reducing the engine speed, and increases the amount of the air taken into the combustion chamber by increasing the engine speed.

7. Claims 16-19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tokuda et al. in view of Maaseidvaag et al. (U.S. Patent 6,167,696).

Re claims 16, 17, and 21, as shown in Figure 1, Tokuda et al. disclose an exhaust gas purification apparatus for an engine having a combustion chamber, comprising:

- an exhaust passage (2),
- a particulate filter (3) arranged in the exhaust passage for removing particulates in exhaust gas exhausted from the combustion chamber by oxidation,
- a device (8, 9) for controlling characteristic of the exhaust gas flowing into the particulate filter, and
- means (temperature sensors (13, 14)) for judging if the particulate filter will be deteriorated by heat derived from the oxidation of the particulates,

Art Unit: 3748

wherein, when the judging means judges that the particulate filter will be deteriorated by heat, the controlling device changes the characteristic of the exhaust gas flowing into the particulate filter to prevent the particulate filter from being deteriorated by heat (see at least Figure 3 and line 55 of column 4 to line 51 of column 5).

Tokuda et al., however, fails to disclose that a precious metal catalyst and an active oxygen release agent are carried on the particulate filter.

As shown in Figures 1 and 4 and indicated on lines 30-38 of column 6, Maaseidvaag et al. teach the use of an integral NO_x trap and particulate filter (filter (22)) to trap soot and NO_x from the exhaust gas. The partition wall (42) of the filter (22) has a NO_x washcoat (54) carrying a noble metal (platinum) and an alkali metal (potassium or lithium). The noble metal and alkali metal are known as oxygen absorbing and active-oxygen releasing agents, and active-oxygen released from the oxygen absorbing and active-oxygen releasing agent oxidizes the trapped particulates; wherein the NO_x absorbent absorbs the NO_x in the exhaust gas when excess oxygen is present in the surroundings and releases the absorbed NO_x when the concentration of oxygen in the surroundings falls is carried on the particulate filter and wherein the characteristic of the exhaust gas flowing into the particulate filter is returned to the original characteristic when a predetermined period has elapsed from when the controlling device changes the characteristic of the exhaust gas, and sulfur adhering on the particulate filter is disassociated from the particulate filter by making the air-fuel ratio of a part or the whole of the exhaust gas rich (see Figure 3 in Maaseidvaag et al. where a process is performed to desulfurize the filter (22)).

Art Unit: 3748

It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have utilized the filter taught by Maaseidvaag et al. in the apparatus of Tokuda et al., since the use thereof would have purified both harmful soot and NO_x emissions in the exhaust gas.

Re claim 18, in the modified apparatus of Tokuda et al., the active oxygen release agent is comprised of an alkali metal (potassium is used in Maaseidvaag et al.).

Re claim 19, in the modified apparatus of Tokuda et al., the alkali metal and alkali earth metal are comprised of metals (potassium in Maaseidvaag et al.) higher in tendency toward ionization than calcium.

Allowable Subject Matter

8. Claims 8-15 are allowed.

Claim 20 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

9. Applicant's arguments with respect to the references applied in the previous Office Action have been fully considered but they are not persuasive.

Art Unit: 3748

In response to applicant's argument that Tokuda et al. fail to disclose a means for judging if the particulate filter will be deteriorated by heat derived from the oxidation of the particulates; and that Tokuda et al. are not concerned with protecting their filter from deterioration due to heat generated by oxidation of particulates (pages 10-11 of Applicant's Amendment), the examiner respectfully disagrees. As clearly shown in Figure 1, Tokuda et al. have temperature sensors (13, 14) located upstream and within the filter, respectively, for judging if the particulate filter will be deteriorated by heat derived from the oxidation of the particulates. As indicated on lines 29-36 of column 2, Tokuda et al. attempt to keep the temperature of the filters from rising to 500°C or more within 30 seconds or so to prevent cracking in the filter, which causes the filter not to function properly. Thus, Tokuda et al. are indeed very concerned with protecting their filter from deterioration due to heat generated by oxidation of particulates.

In response to applicant's argument that Pattas fails to disclose, explicitly or inherently, determining the temperature of the particulate filter or that the temperature is above a certain threshold (page 12 of Applicant's Amendment), the examiner again respectfully disagrees. As depicted in Figure 1, Pattas utilizes temperature sensors (9, 11, 13) at the outlets (7a, 7b, 7c), respectively, to detect the exhaust gas temperatures of the three soot filters (2, 4, 6). Since there is no further combustion of soot at the outlets, these exhaust gas temperatures are relatively high and are good approximation of the temperatures of the particulate filters. As indicated on lines 38-42 of column 3, the temperature value detected by each temperature sensor is compared with a maximum admissible value so that the exhaust gas flow through that particulate filter can be

Art Unit: 3748

adjusted properly. In this way, inadmissible rise in temperature of the filter due to uncontrolled rise of the reaction speed of the combustion of soot can be prevented.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Art Unit: 3748

Communication

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Tu Nguyen whose telephone number is (703) 308-2833.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Thomas E. Denion, can be reached on (703) 308-2623. The fax phone number for this group is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-1148.

Tu M. Nguyen

TMN

Tu M. Nguyen

December 14, 2003

Patent Examiner

Art Unit 3748

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